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CLAIMS

1. Method for the production of an isotropic polymeric network comprising multifunctional molecules with a functionality of at least 5 by reacting in a solvent the multifunctional molecules with a coupling agent, wherein the coupling agent is present in an amount which is sufficient to couple the multifunctional molecules to at least 5 other multifunctional molecules and wherein the sum,  $\rho$ , of the amounts of the multifunctional molecules and coupling agent per unit of volume, in kg/m<sup>3</sup>, is at least equal to the value as given by expression (I)

$$\frac{a(m_1 + \frac{n}{2}m_2)}{10^{26} (d + L)^3} \quad (I)$$

in which

$a = 0.2$

$d$  = the diameter of the multifunctional molecule, including the length of the bonds to the middle of atoms of the coupling agent to which it is attached.

$L$  = the length of the coupling agent, measured between the middle of the atoms that are connected to the multifunctional molecule.

$m_1$  = the molecular mass of the multifunctional molecule as present in the isotropic polymeric network

$m_2$  = the molecular mass of the coupling agent as present in the isotropic polymeric network

$n$  = the functionality of the multifunctional molecule ( $n \geq 5$ )

2. Method for the production of a isotropic polymeric network according to claim 1, wherein  $\rho$  is at least equal to the value as given by expression (I), wherein  $a=0.4$ .

3. Method for the production of an isotropic polymeric network according to any one of claims 1-2, wherein the coupling agent comprises a rod like molecule.

4. Isotropic polymeric network with a density lower than 1000 kg/m<sup>3</sup> and a specific Young's modulus of at least 0.01 GPa.m<sup>3</sup>/kg.

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5. Isotropic polymeric network according to claim 4, wherein the network is substantially free of cavities comprising a gas.
6. Shaped article comprising the isotropic polymeric network according to any one of claims 4-5.
- 5 7. Use of the isotropic polymeric network of any one of claims 4-5 as a construction material.